

Utilization of Local Food to Overcome Nutritional Problems Among Toddlers in Medan Tuntungan

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Abstract — In Indonesia, malnutrition dominates the problem of nutrition which is 4.9% for malnourished children and 31.0% suffer from malnutrition. In North Sumatra, 7.8% of children experience malnutrition and 13.5% suffer from malnutrition. Medan Tuntungan is one among many sub-districts experiencing the problem. The main cause of nutritional problems is the occurrence of infectious diseases and lack of food intake containing macronutrients and micronutrients. Further, one of North Sumatra's local foods is called *Dali Ni Horbo* from Toba Samosir. The purpose of this study was to determine the effect of *dali ni horbo*, food taboos among children, and family income on the nutritional status of toddlers. This study is a pre- and post-test experimental with samples of 25 toddlers who had malnutrition and were given *dali ni hobo* every day for three months. Measurements of body weight were carried out before and after provision of *Dali Ni Horbo*. Paired Samples Test reveals that the sig. value is 0,000 <0.05 meaning that there is an effect in *dali ni horbo* provision on the nutritional status of the toddlers. Further, there is no influence of food taboos among children on the nutritional status of the toddlers. *Dali ni horbo* effectively helps increase body weight. In addition, there is no influence of family income on the child's weight gain. However, sufficient family income can increase body weight by 0.875 times. Moreover, there is no influence of food taboos in increasing toddler weight yet the toddlers who do not have feeding restriction have 0.857 higher chance to have weight gain compared to the toddlers who have food taboos.

Keywords: local food, *Dali Ni Horbo*, toddler's nutritional status

I. INTRODUCTION

The quality of children is a determinant of human resources in the future. Children who have good nutrition will become assets in carrying out development. Therefore, the problem of malnutrition among children need to be solved as early as possible[1]. One of the targets of the Sustainable Development Goals (SDGS) in the health sector is zero hunger which means to end hunger, achieve food endurance and improve nutritional status and encourage sustainable agriculture which targets to end all forms of malnutrition to

reduce stunting and wasting among infants and overcome the nutritional needs of teen girls, pregnant and lactating women, and the elderly in 2030[2].

Nowadays, the problem of nutrition in Indonesia is dominated by malnutrition problems. The prevalence of nutritional status of toddlers based on BB/U is as many as 4.9% of children suffer from malnutrition and 31.0% suffer from malnutrition. The higher rates occur in North Sumatra, namely 7.8% of children with poor nutrition and 13.5% of malnourished children. Meanwhile the prevalence of nutritional status of toddlers (height by age) is as many as 18.5% of Indonesian children are classified as very short and 17.1% is classified as short. In North Sumatra, 23.4% of toddlers are classified as very short and 18.9% is classified as short. In December 2012, there were 114 malnutrition patients in the city of Medan. Among the 39 local government clinic areas in Medan city, the highest number of malnourished patients was in the North Medan area, which were 31 patients (35.34%) consisting of 4 patients at Medan Terjun clinic, 9 patients in Medan Belawan, 3 patients in Pekan Labuhan, 12 patients in Medan Labuhan, and 3 patients in Martubung. Meanwhile, in Medan Tuntungan Subdistrict, there were 2 children with malnutrition in January [3][4][5].

The impact of malnutrition on toddlers is the risk of growth and development interference, susceptibility to infectious diseases and obesity risk in adulthood[6]. The initial stage of nutrient deficiency can be identified by assessing food consumption. Poor food consumption will have an impact on the lack of nutrients in the body. In general, there are two criteria in determining the adequacy of food consumption, namely energy and protein consumption. Energy needs are usually fulfilled from consumption of staple food while protein needs are fulfilled from a number of animal substances, such as fish, meat, eggs and milk. [7][8][9]

Milk is an excellent source of animal protein for toddlers' growth and development. One of them is buffalo milk. The

fermentation of buffalo milk is one of the ways to preserve and diversify food that has been done for a long time. It has advantages because it contains nutrients that are better than non-fermented milk[10][11].

In North Sumatra, especially in Medan, the community knows *Dali Ni Horbo* or *dali* buffalo milk, i.e. buffalo milk that has been processed in such a way as to form a lump like tofu. The tradition of processing buffalo milk into *dali* has been started by the ancestors of the Batak people since the existence of the Batak community. In each typical Batak restaurant, *Dali Ni Horbo* becomes a main menu. To get *dali*, generally in every *onan* (market) in the Tapanuli area, *dali* becomes commodity trading. Currently, *dali* is not only marketed in Tapanuli area but has been traded in traditional markets in the city of Medan[12][13]. The purpose of this study was to determine the effect of *dalli ni horbo*, food taboos of children, and family income on the nutritional status of children.

II. MATERIALS AND METHODS

This study is an experimental pre- and post- test. The samples were 25 toddlers chosen through purposive sampling, aged between 1-5 years, had undernutrition (Z score -3SD until <-2SD), did not have severe infection diseases for one month before intervention, were not allergic to buffalo milk and were willing to participate in research stages. Weight weighing was done before intervention. After *Dali nihorbo* was given every day for three months, the measurement of body weight was carried out again. Nutritional status was measured by calculating body weight compared to the age of the child. The calculated results were then compared with the standard anthropometric table. Measurements were made twice namely at the beginning of the study and at the end of the study. Univariate analysis was carried out to obtain an overview of toddler's weight before and after giving *Dali nihorbo*. Bivariate analysis was used to see the effect of children food taboos and family income on the nutritional status of toddlers and to see the extent to which giving *dalli ni horbo* on the food menu affects the nutritional status of toddlers[7][14][15].

III. RESULTS

The results of the study on the average child weight gain before and after giving *dali ni horbo* can be seen in table 1 as follows.

TABLE I. THE EFFECT OF GIVING *DALI NI HORBO* ON TODDLER'S WEIGHT GAIN

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Body weight before intervention	11.12	25	2.538	.508
	Body weight after intervention	12.56	25	2.583	.517

It can be seen that the average child weight gain is 1,440 gram.

The result of the study on the effect of giving *dali ni horbo* on toddler's weight gain can be seen in table 2.

TABLE II. THE EFFECT OF GIVING *DALI NI HORBO* ON TODDLER'S WEIGHT GAIN

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Body weight before intervention and body weigh after intervention	25	.917	.000

The result of the t-test shows that there is an effect of giving *dali ni horbo* in increasing body weight (sig = 0.000)

The result of the study on Paired Samples Test on the effect of giving *dali ni horbo* on toddler's weight gain can be seen in table 3 as follows.

TABLE III. PAIRED SAMPLES TEST EFFECT OF GIVING *DALI NI HORBO* ON TODDLER'S WEIGHT GAIN

Paired Samples Test								
		Paired Differences				95% Confidence Interval of the Difference	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower			
Pair 1	Body weight before intervention - Body weight after intervention	-1.440	1.044	.209	-1.871	-1.009	24	.000

The result of the research on the effect of family income on the weight gain can be seen in table 4 below.

TABLE IV. THE EFFECT OF FAMILY INCOME ON CHILD'S WEIGHT GAIN

Family Income	Weight Gain				Total		P 0.596 OR 0.875
	Increase		Not increase		n	%	
	N	%	n	%			
Enough	5	50	5	50	10	100	
Not enough	8	53.3	7	46.7	15	100	
Total	13	52.0	12	48.0	25	100	

The result of chi square test shows that there is no effect of family income on child's weight gain (sig. 0.596). The Odds Ratio result indicates that sufficient family income can increase body weight by 0.875 times compared to less family income.

The result of the research on the effect of food taboos in increasing the toddler's weight can be seen in table 5.

TABLE V. THE EFFECT OF FOOD TABOOS IN INCREASING THE TODDLER'S WEIGHT

Food taboos	Weight Gain				Total		P= 0.582 OR 0.857
	Increase		Not increase		Total	%	
	Total	%	Total	%			
No food taboos	6	50	6	50	12	100	
Food taboos	7	53.8	6	46.2	13	100	
Total	13	52.0	12	48.0	25	100	

IV. DISCUSSION

In this study, it is found that there is an effect of giving *Dali Ni Horbo* to toddlers' weight gain. This is because compared to other types of milk, buffalo milk has less cholesterol and good for lowering bad cholesterol (LDL). Buffalo milk also contains more calories than cow's milk (100 calories from 100 grams of buffalo milk; 70 calories from 100 grams of cow's milk). Further, buffalo milk contains vitamin B12 and riboflavin, vitamin A both for eye health and metabolism, vitamin C that helps increase the immune system, vitamin B6, thiamin, folic acid, and niacin. In addition, buffalo milk contains a little cholesterol which is 275 mg per 100 g of fat compared to cow's milk which is 280 mg per 100 g of fat. The milk is good for bone health, dental, cardiovascular health, and weight gain[10][11]

UNICEF (1998) mentions that malnutrition in toddlers are caused by several factors which are then classified as direct causes, indirect causes, main causes and root causes[16]. Poor nutrition is directly caused by lack of food consumption and the presence of infectious diseases. The increasing age of children causes nutritional needs also increase. Meanwhile, the imbalance between food intake and expended energy will cause malnutrition problems in children. If the child does not get enough food, the body's immunity will be weakening. Therefore, they are easily attacked by infectious diseases such as diarrhea or fever accompanied by lack of appetite and ultimately it is easy to suffer malnutrition.

The risk factors associated with severe malnutrition in children aged <2 years are lacking of vaccination, having an unbalanced diet, having low maternal education and being single parents[17]. Chowdhury's research in Bangladesh finds that children from unsafe family food is more likely to have nutritional deficiencies while improper childcare and feeding practices are strongly associated with toddlers' malnutrition[18]. Another research in Haromaya district conducted with logistic regression analysis finds household food insecurity significantly affects weight loss[19]. A study in North Iran finds that children living in food insecurity with severe starvation households are 10.13 times at risk of experiencing less severe body, 10.07 times are at risk of developing dandruff, and 4.54 times tend to be thinner compared to children from food safe households[20].

Other research in Malaysia done using multinomial logistic regression reveals that children in food insecure households are 2.15 times more likely to be underweight and tripled in growth compared to children in households that have food security. [21] Otterbach suggests that the government give more attention to agricultural sub-systems, high-quality food, and food systems as a driver to address child growth in rural and urban areas in middle-income countries such as South Africa[22].

Indirect causes are low food endurance in the family, food taboo, family income, childcare patterns, health services and environmental health. These are three interconnected factors. If the availability of clean water is sufficient for the family, the family's range of health services and facilities is quite good. It is coupled with good mother's understanding on health so that the risk of the child being exposed to disease and malnutrition is less.

The basic cause or root of the nutrition problem is the occurrence of economic, political, and social crises including natural disasters which affect the imbalance between food intake and the presence of infectious diseases which ultimately affects the nutritional status of toddlers.

In this study, there is no relationship between family income on child weight gain. However, the odds ratio shows that sufficient family income can increase body weight by 0.857 times compared to toddlers who have insufficient family income. Family income is the amount of money generated by all family members in the house. Adequate family income will make it easier for families to obtain adequate amounts and quality of food and ensure family food security.

A research in Iran done by using cross sectional design to determine the relation of food insecurity, socio-economic and nutritional factors to nutritional status reveals that socio-economic factors are extremely related to food insecurity and its relation to toddler's body mass index[17][18]. In Terengganu, Malaysia, another research concludes that families with lower socio-economic status have risks of being malnourished[23]. In this study, the researchers also do not find the effect of food taboos on the increase in toddler weight. However, toddlers who do not have food taboos have a .857 higher chance to have weight gain compared to toddlers who have food taboos. Food abstinence means that there are certain types of food that are not consumed by children. The more types of food the children have, the more the children lack of nutrients from the food they are consuming. It shows poor eating and nurturing habits. In Iran, a research shows that the prevalence of malnutrition among school children is proportionally more common in families experiencing food insecurity and bad eating habits[24]. Poor child care practices are also associated with the incidence of malnutrition in childhood [23] Likewise, the result of a study in Western Ethiopia reveals that improper parenting and feeding practices are closely related to under-nutrition among children under five years old [25].

Further research needs to be done on other factors that can affect nutritional status of children. There should also be modification of *Dali Ni Horbo* to other modern consumable forms that are preferred by children.

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CONFLICT OF INTEREST

There is no conflict of interest in this study. The Foundation of STIKes Sumatera Utara has no role in designing the research, collecting, analyzing, and interpreting the data,

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